Relevancy of ARS Research to Sustainable Agriculture

Title XVI of the Food, Agriculture Conservation and Trade Act (FACTA) of 1990 authorizes research programs designed to "--enhance the environment and natural resource base upon which a sustainable agricultural economy depends"– (Section 1062), and defined the term "sustainable agriculture" (Section 1603). The Agricultural Research Service (ARS) of the United States Department of Agriculture is frequently requested to provide information about resources used for research and education projects relevant to sustainable agriculture.

In 1992, a panel was jointly convened by CSREES and ARS to develop a research classification protocol for evaluating existing research projects in relation to their potential contributions to sustainable agriculture. The panel consisted of a farmer, a representative of a nonprofit private organization, two representatives from agribusiness, two representatives from academia, and five representatives from government. A research classification protocol was developed. It consists of seven categories based on the definition of sustainable agriculture presented in Section 1603 of FACTA.

The protocol uses three classification categories for each relevancy category: Contributing to Sustainability (CTS), No Direct Impact (NDI) and Detracting from Sustainability (DFS). To classify a project as CTS for a category, completion of the research project objectives using described methodology must provide new knowledge, innovations or technology that will have a direct positive impact on the topic covered by the specific relevancy category. If the project does not deal with a specific relevancy category, or the results of the research are perceived to have no direct impact on the category, it should be classified as NDI. If the results of the research project are perceived by a panel member as having a direct negative impact on a sustainable agriculture relevancy category, the project should be classified as DFS.

A final score for each project is calculated by subtracting the number of categories classified as DFS from the number of classified as CTS. To be considered as a sustainable agriculture research project, it must receive a score of 4 or greater. Projects receiving a score of 2 or 3 are activities that should contribute significantly towards achieving the goals of sustainable agriculture. Those receiving a score of 1 are activities dealing with one or more component of sustainable agriculture, but not usually designed with sustainable agriculture as a major research objective. Projects receiving DFS evaluations should be reviewed in detail to determine their relevancy to purposes of Title XVI of FACTA of 1990.

Knowledge from fundamental research is frequently neutral in relation to sustainable agriculture. These projects will be so classified. For example, the project entitled "Function of Nematode Feeding Tubes" is an extremely important fundamental research activity. The knowledge obtained by completing the objectives of this project could contribute to the development of future mission-oriented research or technology designed to have a direct positive impact on sustainable agriculture, or it could lead to a mission-oriented research or technology that might have a negative impact on one or more of the components of sustainable agriculture. Fundamental research, however, is imperative for a sustainable agriculture.

Sustainable Agriculture Relevancy Criteria

Integrated System of Plant and Animal Production Practices

Research dealing with whole-farm systems - The research should include the influence of noncontrollable variables, farm enterprise managers, external inputs, management of the atmospheric, aquatic, energy, soil and organic resources of the ecosystem in relation to food, feed or fiber production. In general, the research should use a holistic and interdisciplinary approach. The objective should be to sustain the economic viability of the specific farming enterprise type while making effective use of natural resources in an environmentally sound manner, and to use appropriate natural biological cycles and controls to minimize dependency on external inputs.

Satisfy Human Food and Fiber Needs

Research designed to contribute to the long-term goal of producing an adequate amount of safe and nutritious food and of fiber in an economically viable, environmentally sound and sociologically acceptable manner. In general, the research should focus on technologies and practices that reduce dependence of crop and livestock agriculture on external inputs such as fuel, irrigation water fertilizers and pesticides.

Enhance Environmental Quality

Research designed to enhance environmental quality through the development of practices that minimize the degradation of soil, water, air or organic resources from chemicals, erosion or waste products, or restores them. The research may deal with concerns of both off-site and on-site impacts of agricultural practices. This may be accomplished through efficient utilization of nutrients and practices that prevent leaching, control erosion or recycle wastes safely and beneficially through application to agricultural lands.

Natural Resource Conservation and Enhancement

Research that promotes the development of technologies and practices that conserve soil, water, energy and organic resources. Natural resource conservation research in agriculture usually deals with processes designed to make more efficient use of natural resources or to control the degradation of these resources. Control of erosion, nutrient runoff and organic matter depletion are examples of types of natural resource conservation that can be achieved through the development of procedures such as reduced tillage, covercrop and crop rotation systems. Provision of adequate levels of micronutrient from industrial wastes or other sources is another example of natural resource conservation.

Biological Resource Utilization

Research leading to the development of technologies and practices that promote the use of

beneficial biological systems and processes to maintain and improve soil quality, protect crops and reduce the need for external inputs. Examples include biological pest controls, biological nitrogen fixation, recycling of organic wastes and residues, composting of rural, suburban and urban wastes and increasing populations of beneficial insects, nematodes, earthworms and microflora. Crops may also be selected or genetically altered for characteristics that improve soil physical properties, drought tolerance, pest and disease resistance, and production of organic residues which protect soils from erosion and ground water from contamination.

Economic Viability

Research designed to develop practices and systems that minimize risk and enhance the economic viability of farm operations, with emphasis on the family farm. The research should focus on long-term sustainability, but cannot ignore the need for short-term economic survival. The impact of local, state or national farm policy should be included. To avoid continued overloading and depression of prices in the food and fiber markets, avenues should be developed to enter farm products in alternative markets such as energy, paper and building materials; development of new products is an example of contributing to economic viability and may also support quality of life.

Quality of Life

Research that promotes the development of farming systems designed to enhance the quality of life for farmers, members of rural communities and society as a whole. The research should result in improved health, safety, and stability in the rural community; it should contribute to increased on-farm and local employment through emphasis on local added value opportunities and on reduction of dependence on purchased inputs by substituting managerial increases of on-farm and local employment through emphasis on local value added opportunities and on reduction of dependence on purchased inputs by substituting managerial skills and local resources.